Committee Activity Report and Minutes of the Meeting
7 April, 2000
CIE TC 2-39
Geometric Tolerances for Color Measurement

Terms of Reference

Compile a technical report and recommendations specifying the geometric tolerances for the various geometries in colorimetry, including 0/45, 0/d and others. Parts of this technical report may be suitable for inclusion in a CIE standard specifying several geometric tolerance levels.

Working Program

Utilize ISO 5/1 and ASTM E 1767 to develop a system of specifications for the geometry of color measurements. Define the specifications in the following order: Reflectance factor (t/8, d/8, d/0), radiance factor (45/0) and transmittance geometries (0/0, d/0). Specifications will be developed via computer simulation & verified experimentally.

Current Committee Membership:

A Bittar (New Zealand), J. Taylor (United Kingdom), E. Early (USA), L. Hanssen (USA), G. Baba (Japan), B. Jordon (Canada), J. Zwinkels (Canada), K. Witt (Germany), N. Johnson (USA), D. Rich (USA), Chairman, R. Fisch (USA), J. Pietrzykowski (Poland), A. Kravetz (USA), J. Ladson (USA), J. Decarreau (France)

Consulting Member: W. Erb (Germany)

Status

The Committee met for the sixth time just prior to the CIE Division 2 meeting in Teddington, England at the National Physical Laboratory. Three committee members and twelve guests were present. An agenda was handed out and an additional item added concerning the work of ISO TC 42 / ISO TC 130 joint working group 21 who are revising the standards ISO 5 parts 1 to 4. The revised agenda was approved. The minutes and activity report from 1999 were reviewed and approved.

The Technical Committee Chair (TCC) reviewed the action items from the last meeting (see document 2-39/15). Many of the action items were not completed and so a second draft of the committee report has not yet been prepared. Measurement data was received from committee member G. Baba. The data have been put up on the Division 2 web site for access by CIE Division 2 and TC 2-39 members. The data show clear confirmation of the geometric definitions and tolerances recommended by the committee. As a result of the lack of activity from the committee members, the program of work is now 18 months behind schedule.

Mr. D. McDowell, Chairman of ISO TC 130 reported on the work of Joint Working Group 21 formed between ISO TC 42 and ISO TC 130 to revise ISO 5, parts 1-4. Explained the philosophy of the JWG and the progress to date. D. Couzin asked about whether ISO 5 set specifications on the azimuthal angles. D. Rich commented that it does indeed specify annular illumination but does allow discrete circumferential approximation to the full annular geometry. Mr. McDowell also raised the issue that ISO 5/4 defines a diffuse transmittance geometry that uses an opal glass diffuser instead of an integrating sphere and wondered if this geometry could be added to the TC 2-39 report. N. Johnson commented that we could try to add a definition of opal glass diffuse transmittance to the section of the report that covers diffuse transmittance. Committee members thought that it would be a good idea if we could get a good definition of the geometry. D. Couzin thought that it might be possible to treat the system as opal glass + specimen rather than making the opal glass part of the instrument. D. Rich commented that committee E. Early has recently published work done at NIST on this type of measurement — indicating that NIST had established and was providing realizations of a scale of opal glass diffuse transmittance. The TCC will follow up with Mr. Early about this measurement geometry. Mr. McDowell volunteered to send the committee copies of a paper that he wrote that describes the correspondence between opal glass transmission density and integrating sphere transmission density on two color film bases.

Incorporating the opal glass diffuse transmittance specifications will bring together the work of CIE Division 2 and ISO TC 42 and TC 130. J. Taylor of NPL commented that the committee should make every effort to bring these three groups together and harmonize the two geometric specifications even further that we have to date. Mr. McDowell indicated that current reports, drafts on working documents from the ISO JWG can be found on the web page at (ww.pima.org/tc42/programofwork/JWG21/). The TCC will submit documents to ISO JWG21 through Mr. McDowell in order to form a closer liaison with them on drafting standards on the geometry for color measurements.

Mr. Andrew Hanson of NPL commented, indicating that he has been testing integrating sphere uniformity and geometric tolerances as well. He supplied some print-outs of goniophotometric characterizations of several different materials standards. His results show very similar behavior to that of Mr. Baba and is in qualitative agreement with the experiences of committee member, N. Johnson. Mr. Hanson also commented that some instruments exhibits spatial displacements of the influx or efflux images in the specimen plane.

Committee member, J. Zwinkels reported on some additional changes that need to be made to the draft document. Some of these changes had already been suggested and noted at the Warsaw meeting last year. Others were truly new changes and were noted in Draft 1 and will be incorporated in the next draft. She also requested that the next draft put the definitions and specifications back into tabular form rather than in textural form

The committee desires to hold the next meeting in conjunction with the Council on Optical Radiation Measurements meeting, to be held in Gaithersburg, Maryland in May of 2001. Mr. McDowell invited the TC members to attend the next meeting of JWG˚21 which will be held in the fall of 2000 in Tokyo, Japan.

Action Items Resulting from this Meeting:

1. TC Chair to contact E. Early about defining the geometry for opal glass diffuse transmittance and diffuse transmittance density.
2. TC Chair to submit TC documents to ISO TC 42 / TC 130 Joint Working Group 21 in care of Mr. David McDowell.
3. D. Couzin to investigate the use of a three parameter definition of the geometry of color measurement.
4. N. Johnson to have engineering drawings prepared to illustrate the defining angles and tolerances and send copies to the TC Chair.
5. The committee members are to send terms and their definitions for inclusion in the Terminology section of the document.
6. A second draft of the committee report is to be sent of for discussion by the TC by the fall of this year.

Respectfully submitted,

Danny Rich, TCC